



UNFOLDING THE ILLUSIONS AND FACTS OF GALLSTONES

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ABSTRACT

Gallbladder is a pocket that stores bile. Gallstone disease (GSD) has, for many years, remained a high-cost, socially significant public health problem.

Gallstones are a major cause of morbidity and mortality throughout the world. Gallstones are known to produce diverse histopathological changes in the gallbladder. They vary in size and shape from as small as a grain of sand to as large as a golf ball. The presence of gallstones do not produce any kind of symptoms in most of the cases. The abdominal pain can be due to acid reflux. Gallstones are different from kidney stones. Drinking more water or liquids to flush out small kidney stones definitely works. There is no medical evidence that says that consuming more liquids or milk can get rid of gallstones or dissolve them away. Once removed, gallstones are not going to come back. If the gallstones get into the bile duct obstructing the flow of bile juice, an endoscope is used to remove them. This doesn't mean that the stones are gone forever and are not going to come back. The stones may start forming again just like the kidney stones that recur. It is tricky that Gallstones cause gallbladder cancer. Laparoscopic cholecystectomy is now the gold standard for treatment of symptomatic gallstones

KEYWORDS: Gallstone disease; Microbiota; Bile acids; Bile duct stones, Cholecystectomy

INTRODUCTION

The prevalence varies with age, sex and ethnic group. Most people are unaware of the disease and remain asymptomatic for life (1)

Frequently, chronic cholecystitis presents a large range of associated lesions such as cholesterosis, muscle hypertrophy, parietal fibrosis, polypoid and adenomatous proliferation of mucous glands, metaplasia, hyperplasia and dysplasia (2)

A significantly higher incidence of carcinoma gall bladder has been observed in patient population with a traditionally high incidence of gallstones (3) Gallstones are hardened deposits of the digestive fluid bile that can form within the gallbladder. (4)

Alternatively, gallstones can impact at the narrowest portion of healthy small, bowel causing an obstruction termed gallstone ileus (5)

Gallstones and gallbladder cancer are the two most prevalent benign and malignant disorders, respectively (6,7).

The benign gallbladder diseases present with various imaging appearances and may mimic those of gallbladder malignancies (8,9)

Traditionally, ultrasound (US) has been the preferred first-line imaging technique for suspected gallbladder disease. Given its rapid ascendancy, computed tomography (CT) has also become a mainstay in evaluating gallbladder disease, whereas magnetic resonance imaging (MRI) is generally considered a problem-solving tool (10,11)

Recent technological advancements have now prompted the use of contrast-enhanced US (CEUS), high-resolution ultrasound (HRUS), and advanced MRI sequences for gallbladder evaluations, enabling greater diagnostic precision and facilitating the distinction between benign and malignant gallbladder disease (12)

Cholithiasis is the second most frequent complication of common bile duct (CBD) diseases and occurs in 10% to 15% of CBD patients (13)

Single stage laparoscopic procedure with laparoscopic transcystic stone extraction (LTSE), two-stage approach combining laparoscopic choledochotomy (LC) with pre- or post-operative endoscopic retrograde cholangiography (ERC) (14)

While a causal effect of gallstones on gallbladder cancer is probable, variation in estimates of risk have been observed in previous studies, most likely due to differences in study design and the methods used to collect information on gallstones (15)

In addition, we used genetic variants strongly associated with risk of gallstones to estimate the causal effect of gallstones on risk of gallbladder cancer within a Mendelian randomization (MR) framework. (16,17)

In some patients however the symptoms may persist even after surgery. These include upper abdominal pain, dyspepsia with or without jaundice. (18,19)

Of note, many of the genetic variants identified to proxy the presence of gallstones are associated with cholesterol metabolism (20)

History

The first account of gallstones was given in 1420 by a Florentine pathologist Antonio Benivieni, in a woman who died with abdominal pain. Gallbladder, gallstone, cholecystitis, hyperplasia, metaplasia, carcinoma Cholelithiasis has been described as a disease of civilization. They have been observed in Egyptian mummies dating as back as 3400 B.C. It appears likely that Charaka (two centuries B.C.) and Sushruta (six centuries B.C.) from India were also familiar with this disease of the biliary tract.

Gall stones – Illusions and facts

Delusion-1

Gallstones produce abdominal pain
The presence of gallstones do not produce any kind of symptoms in most of the cases. Only about 3% of patients see some symptoms of gallstones. The abdominal pain can be due to acid reflux or other medical condition that might be present.

Delusion-2

Drinking more liquids, will remove gallstones from the body
Gallstones are different from kidney stones. Drinking more water or liquids to flush out small kidney stones definitely works. But it is different with gallstones, There is no medical confirmation that says that consuming more liquids or milk can get rid of gallstones or dissolve them away.

Delusion-3

Turning to vegetarian diet can avoid formation of gallstones
There is no research or study done on vegetarians that concludes that not consuming any kind of meat helps in avoiding gallstone formation.

Delusion-4

Medicines are available to dissolve gallstones
There are medicines that can help in removing smaller gallstones but there is no sure shot way to dissolve gallstones of any size.

Delusion-5

If gallstones are detected, better undergo medication or surgery
A good gastroenterologist will never put you under medication or advise you to go for a surgery just because he/she detected gall stones while diagnosing other conditions (unless they are large and showing symptoms). (21)

Gallstones: Causes, symptoms

The condition of having gallstones is known as cholelithiasis where gallstones mean small stones made of cholesterol that form in the gallbladder. "Gallstones present only common symptoms like hyperacidity, nausea, pain in abdomen. However, these stones can later on cause many complications as mentioned above (22)

Gallbladder gangrene reported in 5 Covid-recovered patients:

Delhi's Sir Ganga Ram Hospital recently treated five patients who were diagnosed with gallbladder gangrene after recovering from Covid.

The patients — four men and one woman — were among the first such cases in India, as per reports. Some of the symptoms they complained of were fever, pain in the right upper quadrant of abdomen, and vomiting.

What is gallbladder gangrene? Dr Sudeep Khanna, senior consultant gastroenterologist, Apollo Indraprastha Hospitals, New Delhi, tells indianexpress.com "Gallbladder gangrene is defined as necrosis and perforation of the gallbladder wall as a result of ischemia (inadequate blood supply to an organ or part of the body) followed by progressive vascular insufficiency." Symptoms of gallbladder gangrene include dull pain, fever, nausea or vomiting, and low blood pressure which could be a sign of septic shock (a life-threatening condition), according to Dr Khanna (23)

Diet diary: As western diets take hold, there are growing gallstone cases

Gallstone disease, the lifestyle related condition once associated with the western world, has markedly increased here due to the growing popularity of western diets. Although the exact causes of gallstones are not known, they are believed to have multi-factorial origin, with interaction of both genetic and environmental factors. Common risk factors include obesity, food allergies, sensitivities, ageing, hormone (estrogen) treatment, pregnancy, diabetes, Crohn's disease, cystic fibrosis, liver disease and even crash dieting. (24)

A glass of wine a day 'cuts risk of gallstones by a third'

A goblet of wine a day can keep gallstones away, say researchers.

A new study has revealed that drinking a moderate amount of alcohol, say a glass of wine daily, protects against the development of gallstones — in fact, it can cut the risk by nearly a third. Gallstones form in the gallbladder from bile and are generally made up of hardened cholesterol. They can be very painful and treatment is surgery to remove alcohol, say researcher Dr Paul Banim of University of East Anglia said alcohol was known to increase levels of "good" HDL cholesterol which was also known to be protective against cardiovascular disease and which could alter the composition of cholesterol in the bile (25)

About 20 million Americans are believed to have stones in their gallbladders

Gallbladder is a storage vessel, just like the urinary bladder. Bile, a chemical needed for digesting fats, is manufactured in the liver and stored in the gallbladder until needed. A healthy gallbladder, tucked under the liver high in the abdominal cavity, is about four inches long and an inch in diameter. It has a capacity of a couple of tablespoons and a narrow neck through which bile is excreted at the rate of about a quart a day. About 20 million Americans are believed to have stones in their gallbladders, chiefly so-called cholesterol stones. The other kind, pigment stones, are more common in some other parts of the world. In about half a million Americans each year, the stones produce symptoms calling for treatment; in most of the others, no symptoms are observed. The chance of trouble from silent gallstones is only about one in five over a 20-year period. (26)

Health Wise: Is gallbladder removal safe?

Gallstones are pebble-like collections of cholesterol and other substances that form in the gallbladder and cause chronic inflammation and pain. Many people believe no treatment is needed for gallstones that are small or are not causing pain. They're wrong. Gallstones are the most common risk factor for cancer of the gallbladder. (27)

Doctors call for early diagnosis of gallstones

It is estimated that around 2.5 crore people in the country could have gallbladder stones but could remain asymptomatic, say doctors. The gallbladder stores concentrated bile and releases it when food passes through the intestine. (28)

1,000 stones removed from Kolkata man's liver, gallbladder and bile duct at Hyderabad hospital | Cities News, The Indian Express,
Doctors at a Hyderabad hospital announced the removal of more than 1,000 stones from a 39-year-old patient's liver, gallbladder and common bile duct during a recent surgery. (29)

A gene defect that causes gall stone -

Scientists working at the Asian Institute of Gastroenterology (AIG) here have discovered that a genetic defect due to a mutation in gene, ABCG8, in the liver causes growth of gall-bladder stones in Indians. The discovery, made for the first time in Asia, is likely to result in more accurate diagnosis, reduced cost of treatment, use of preventive medicine (UDCA) for those having genetic mutation, and reduced chances of cancer and death.

Mutation in gene, ABCG8, in the liver was resulting in excess excretion of cholesterol into the bile causing cholesterol gallstones. Along with the age of the patient the secretion increases causing more gallstones in older patients.

The research was published in the 'Journal of Gastroenterology and Hepatology, 2010', he said. Earlier, it was thought that gall stones resulted from eating fatty food, food containing high refined sugar, obesity, lack of exercise, etc. Now, these are found to be hereditary and have high incidence among the twins. (30)

ZAPPING GALLSTONES - The Washington Post

A new, nonsurgical treatment for dissolving gallstones is showing promise in a series of human tests that could change the way gallbladder disease is treated for a significant number of patients. Some 65 hospitals -- including three in the Baltimore-Washington area -- are involved in clinical trials of the new treatment, which has been performed on nearly 1,000 patients so far. George Washington University Medical Center also has been treating gallbladder patients with lithotripsy since June as part of a clinical trial. Later this month, Georgetown University Hospital will begin using the procedure on patients as part of yet another clinical trial. An estimated 20 million Americans have gallstones, which take months and probably years to form. (31)

EXERCISE SEEMS TO PREVENT GALLSTONES

The risk of gallstones appears to be lowered by regular exercise and raised by a sedentary lifestyle.

Gallstone disease in men could be prevented by 30 minutes of vigorous exercise five times per week, researchers concluded. Men in the study who watched at least 40 hours of television per week -- an indication of sedentary habits -- had more than twice the risk of gallstones compared with those who watched less than six hours a week. The findings suggest that exercise can help prevent gallstones in ways that go "beyond its benefit for control of body weight," a factor in gallstone disease, researchers said.

Gallstones and Microbes

The microbiome of bile correlates with the bacterial composition of saliva, and the microbiome of the biliary tract has a high similarity with the microbiota of the duodenum. Pathogenic microflora of the oral cavity, through mechanisms of immunomodulation, can affect the motility of the gallbladder and the expression of mucin genes (MUC1, Muc3, MUC4), and represent one of the promoters of stone formation in the gallbladder. The presence of H. pylori infection contributes to the formation of gallstones and affects the occurrence of complications of GSD, including acute and chronic cholecystitis, cholangitis, pancreatitis. Intestinal bacteria (Clostridium, Bifidobacterium, Pepto streptococcus, Bacteroides, Eubacterium, and Escherichia coli) participating in the oxidation and epimerization of bile acids can disrupt enterohepatic circulation and lead to the formation of gallstones (32)

Differential diagnosis**Diagnosis**

- Tests and procedures used to diagnose gallstones and complications of gallstones include:
- Ultrasound. Ultrasound is the best imaging test for finding gallstones. ...
- Computed tomography (CT) scan. ...
- Magnetic resonance imaging (MRI). ...
- Cholescintigraphy. ...
- Endoscopic retrograde cholangiopancreatography (ERCP).

Abdominal ultrasound. This test is the one most commonly used to look for signs of gallstones. Abdominal ultrasound involves moving a device (transducer) back

and forth across your stomach area. The transducer sends signals to a computer, which creates images that show the structures in your abdomen. Endoscopic ultrasound (EUS). This procedure can help identify smaller stones that may be missed on an abdominal ultrasound. During EUS your doctor passes a thin, flexible tube (endoscope) through your mouth and through your digestive tract. A small ultrasound device (transducer) in the tube produces sound waves that create a precise image of surrounding tissue. Other imaging tests. Additional tests may include oral cholecystography, a hepatobiliary iminodiacetic acid (HIDA) scan, computerized tomography (CT), magnetic resonance cholangiopancreatography (MRCP) or endoscopic retrograde cholangiopancreatography (ERCP). Blood tests. Blood tests may reveal infection, jaundice, pancreatitis or other complications caused by gallstones

Treatment

Laparoscopic cholecystectomy, the new operation described in the adjoining article, is only one of several possible treatments, medical as well as surgical. The standard type of surgery is the one that gave Lyndon Johnson his photogenic scar -- an opening of the abdominal wall and straightforward removal of the gallbladder. Sometimes, the condition can be controlled medically through the use of drugs either derived from natural acids or synthesized. Another chemical, called methyl tert-butyl ether, is sometimes used for stones that are inside the gallbladder proper but not usually for those that have left the organ and are stuck farther along the excretory system. When stones pass through the neck of the gallbladder into the cystic duct but then lodge in the so-called common duct leading from the liver to the intestine, the problem can sometimes be handled with an endoscope. This is a flexible tube passed through the mouth, throat, stomach and large intestine into the common duct, from which the obstruction can be retrieved. This eliminates the need for open surgery. Another nonsurgical technique for disposing of troublesome gallstones is lithotripsy, which is already widely used in this country for treatment of kidney stones. Sound waves from a special type of machine are focused on the stones deep inside the patient's body, and these are pulverized so they can be excreted without pain. Because the gallbladder is situated much higher up the torso than the kidneys, concern over possible interference of the shock waves with heart rhythms caused development of gallstone lithotripsy to proceed more slowly than for kidney stones

The following are the treatment options available for the gall stones

Surgical options

Surgery to remove the gallbladder (cholecystectomy). Once the gallbladder is removed, bile flows directly from liver into small intestine, rather than being stored in gallbladder. Gallbladder removal doesn't affect the proficiency to digest food, but it can cause diarrhoea, which is temporary.

OPEN CHOLECYSTECTOMY - the initial gold standard of treatment for gallstones, until the advent of laparoscopic cholecystectomy.(33)

- Laparoscopic cholecystectomy has become widely used since it was first performed in 1988(34)

The evaluation and treatment of suspected stones in the common bile duct can be carried out by endoscopic retrograde cholangiopancreatography before laparoscopic cholecystectomy.(35)

OPEN CHOLECYSTECTOMY	LAPAROSCOPIC CHOLECYSTECTOMY
Advantages	Advantages
Candidates with Multiple abdominal surgeries before or suspected extensive adhesions	usually only one night in the hospital postoperatively
Less operating time	postoperative pain is greatly reduced
	patients can usually return to work early (one to 2 weeks)
Disadvantages	Disadvantages
pain and weeks of disability	patient who has undergone abdominal surgery a number of times may not be a suitable candidate for Laparoscopic cholecystectomy because of extensive adhesions around the gallbladder.
patients can usually return to work is delayed (4 to 6 weeks)	
Hospital stay prolonged	more operating time

CONTACT DISSOLUTION THERAPY

The solvents like the organic solvent methyl tert-butyl ether into the gallbladder through a percutaneous catheter placed through the liver.

Alternatively, a nasobiliary catheter can be endoscopically guided into the gallbladder can be used for instilling the organic solvent.(36)

This is a technically difficult and hazardous procedure, and should be performed

only by experienced doctors in hospitals where research on this treatment is being done. Serious side effects include severe burning pain.

Finally, a mixture of plant terpenes may also be useful for dissolving radiolucent gallstones, particularly when used in combination with a bile acid.(37)

Medications to dissolve gallstones.

Medications taken by mouth may help dissolve gallstones. But it may take long time treatment to dissolve gallstones in this way, and gallstones will likely form again if treatment is stopped.

Conclusions

Great majority of cases, calcium or cholesterol "stones" that the gallbladder produces lie quietly inside and cause no problems. It is when a stone plugs the organ's sole exit like a cork in a bottle, or becomes stuck farther along a tortuous duct system, that trouble occurs. About million people are believed to have stones in their gallbladders, chiefly so-called cholesterol stones. The other kind, pigment stones, are more common in some other parts of the world.

GBC is a common cancer among Indian women and seems to be associated with gallstone disease. It usually presents in an advanced stage in majority of the cases, which poses serious challenges in effective management strategies

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